THE AMERICAN ARCHITECT AND BUILDING NEWS.

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WHILE architects and engineers are hard at work devising schemes of ventilation for buildings, and while physicians and boards of health are urging the public to take an interest in them, there comes every now and then a sharp reminder that it is not enough to provide elaborate appliances, and that in certain cases these may even do serious injury by aggravating the evil they are meant to relieve. It is not long since public attention was called to the wretched condition of the air in the Representatives Hall at Washington; and it was found on examination that, through neglect and misuse, the ventilating apparatus and the sources from which the air was introduced had been so befouled as to make the air already offensive when it was delivered into the hall. More lately a still worse story is told of the condition of the new County Court House at New York. The City Record for June 10 gives the reports on the subject by the consulting sanitary architect of the health department, Mr. Pfeiffer, and Messrs. Tracy and Nealis, sanitary inspectors. The Court-House, in building which, as our readers know, economy was not allowed to greatly interfere, was provided with a costly and elaborate apparatus which ought to have insured a plentiful supply of fresh air for all its needs. The building was provided with four fans for forcing in air, each of which was driven by its separate high-pressure steam-engine; and which, drawing in air through four outside openings, delivered it into sixteen air-chambers heated by coils of steam-pipes, and from thence distributed it throughout the building. Registers for the escape of foul air were placed near the ceilings of the rooms, and flues carried from them to a garret-chamber, from which it was expected to escape through louvre-openings in the roof. With all this provision for supplying fresh air, the atmosphere of the court-rooms has for a good while been intolerable, and the supply of air so bad that the clerks in the offices have in winter preferred to close the registers, and suffer from cold, rather than endure the smells that it brought.

THE apparatus appears, though unskilfully adjusted and wastefully planned, to have been capable of doing tolerably well the work required from it, except in regard to the ducts for the escape of foul air, which are said to be quite insufficient. But examination showed that it was in a most deplorable condition. Supply-ducts had been provided to take the fresh air above the roofs; but these had been disconnected, and the air was drawn from the cellar. The areas through which the air got into the cellar were defiled with vegetable and animal filth; the cellar itself was foul and musty; and there was a leak of gas in it under a heap of coal, where, being not easy to reach, it was neglected. The coils of steam-pipes were loaded with street dust ready to give out a noxious effluvium when heated. The water-closets and urinals were foul to nastiness, and most of them had no ventilation into the outer air; the habit of blowing off the boilers into the sewers had the effect of frequently forcing sewer-gas into the building, and of unsealing the traps. Of the ventilators in the rooms, which were inadequate at the best, only about a quarter were found to be in working order; and, finally, the open space in the garret into which all the ventilating flues opened was almost cut off from communication with the outer air, and so connected with the rest of the building by stairways, that the foul air which found its way into it was in good part returned, after being cooled by contact with the roof, to resume its circulation through the rooms below.

THESE facts point the moral, that when people are persuaded that ventilation is desirable, and that to obtain it money must be spent, the difficulties are not yet overcome; but that the ventilating and heating apparatus of a building must, in the first place, be put in under direction of some one who has carefully studied it, — the architect of the building, or a competent engineer, — and that when this has been done it is indispensable that it should be under skilled control; and that to leave it to the management of careless and untrained persons, means serious mischief. The man who has charge of the appliances of a large building should not merely be taught by rote to open or shut certain dampers and valves and cocks; but he should clearly understand the construction and operation of his machinery, and should keep it clean and in order, with the same pains that an engine-driver does his engine. Moreover this suggests the need of a properly qualified inspector, whose duty it shall be to see that an important building is not allowed to fall into disorder through neglect and misuse. In France and Germany, every important public building is placed permanently under charge of some architect; and such a system here would undoubtedly save a great deal more than it would cost. One is tempted to ask how were the occupants of the New York Court-House engaged, that they allowed their water-closets to become filthy, their ventilators to get out of order, and air-supply befouled, without interference. It would probably be answered, that there was no competent person at hand whose business it was to look after such matters.

IN view of the late destruction of two or three of Wren's churches in conservative London, against the earnest protestations of their admirers, it is perhaps not strange that in Boston, the Old South Church, whose fate has been for a long time the subject of a lively quarrel, should at last have come under the hammer. We are glad to see that, at the eleventh hour, an energetic effort is making to secure and preserve the building as a memorial. When it was found that the building would be sold for its materials, Messrs. George W. Simmons and Son, of Oak Hall fame, offered, if the church and premises could be bought by subscription, to contribute ten thousand dollars toward the purchase-money; and, on condition of being allowed to occupy the building for twenty years, to guarantee the subscribers three per cent on the purchase-money; and, at the end of the twenty years, to turn it over to them uninjured. This proposition, however, was not met; and the building alone was sold at auction a few days ago, on condition that it should be taken down and removed within sixty days. After the sale, the Messrs. Simmons showed the sincerity of their interest by coming forward with a second proposition. They secured from the purchaser the right to hold the church uninjured for a week, and promised to be responsible for one hundred thousand dollars of the purchase-money, if the remaining two hundred and fifty thousand dollars required could be raised by subscription during that time. A public meeting in aid of the movement was held in the church; a committee was appointed to raise subscriptions, of which Gov. Rice was made the chairman; and a plan was arranged, by which the church should be kept under the supervision of the Massachusetts

Historical Society. At our day of writing, it is still uncertain whether the necessary amount will be subscribed or not; but the movement has excited great interest in the public, and it promises well.

A GOOD deal of abuse has been flung at the modern architecture of Munich for being a collection of copies, and the city has been called a city of casts. The visitor who examines King Ludwig's work certainly is tempted to laugh or mourn at the money and effort spent in whims of reproduction. Nevertheless there are one or two things for which we have reason to thank the late king. Any architect of our day would be fervently thankful for a sight of an old Greek temple as the Greeks saw it; and, for the one existing thing that presents such a temple in its real aspect, we may afford to be grateful, even if we should not think it, all things considered, worth while ourselves to build such a thing. For a mock Pitti Palace, or any other imitation of which the original exists, we are not moved with much sympathy. But whatever there may be to make us smile in the efforts that have been made to give the building a *raison d'être*, Von Klenze's Walhalla at Regensburg is, as a monument, its own justification; for it is very beautiful, and without it the people of this day would not have had the opportunity to realize by actual sight the beauty of the most perfect form of architecture that has ever been designed. To any eye of to-day the thing is externally as Greek as if a Greek had built it; and it is unique, for all the other attempts to reproduce a Greek temple have been botches. But now it appears that it is in danger of being spoiled; since it is found that the rather precipitate efforts which have been made to store it with a fair show of German notabilities have overshot the mark, and it is getting so full of busts and memorials that it will soon hold no more; therefore a proposition is made to build an addition to it, and give a chance for more busts. It has been suggested that a competition be set on foot for designs of an appropriate extension. But a Greek temple is one of the complete things that cannot be meddled with without being marred: it would be as easy to design an addition to a billiard-ball. Fortunately the Walhalla so crowns the top of a narrow eminence that it would be difficult to find room for an addition; and this may save it.

THREE more projects for ship-canals have just been brought forward, — two of them in France. The first, the *Grand Canal du Midi*, is an enlargement of the canal that already extends from Agde on the Mediterranean, near Narbonne, by Carcassonne, to Toulouse, which it is proposed to increase to thirty feet in depth, and three hundred feet wide at the bottom, making a ship-channel across to the navigable waters of the Garonne, and so by Agen and Bordeaux to the Atlantic. This is expected to cut off nine hundred miles from the voyage between the Atlantic ports and India. It may occur to the traveller in Southern France, that the diversion of the canal into the streets of Narbonne would not be too much for the cleansing of that dirty town.

A later and greater project is, to connect the British Channel and the Mediterranean by a canal navigable to vessels of two hundred tons. It is proposed to improve the navigation of the Seine and its tributary the Yonne, to the point where the old Burgundy Canal joins the latter river; and then, enlarging the canal to its junction with the Saone, make the Saone and the Rhone, into which it flows, the highway to the Mediterranean at Marseilles. This project, for which the estimates are only sixty-five millions of francs, has excited much interest in France, although, like M. Lesseps' Suez Canal, it is likely that it would be most used by English vessels. It makes a shorter route from England and the Channel than the *Canal du Midi*, and avoids the notorious discomforts of the Bay of Biscay. It would hardly be used except for steamers; for, to say nothing of the question of towage, sailing vessels could not pass the bridges on the Seine at Paris and elsewhere.

THE third project is a new form of the old scheme for a ship-channel across the Isthmus of Panama, a plan for which was proposed and warmly advocated a year ago by Commander Selfridge of the United States Navy. It is said to be a matter of record in Spain, that in 1680 a party of four hundred "filibusters," in eighteen canoes, went up the Atrato, a small river in Colombia that falls into the Caribbean Sea a hundred miles or more east of Aspinwall, and, guided by Indians, dragged their canoes through a series of swamps west of the river, till they reached a tributary of the River Tuira, which runs into the Bay of San Miguel on the Pacific side. A hundred years later, the pass was explored by order of the Spanish Government, and the fact established that at this point there was a break in the mountain chain that connects South and Central America, through which a water-passage was feasible. It is further said that the Spanish Government forbade the ascent of the Atrato, under heavy penalties, lest the discovery of the route should make competition with her Pacific trade; a point which is not very clear. Strangely enough this passage, which avoids the necessity of the locks which were an indispensable and troublesome part of Commander Selfridge's scheme, is said to have been forgotten and unknown of late years, and to have been just rediscovered. It is now brought into notice by one Señor Gogorza, a Colombian, in whose behalf the president of the State has sent a message to his Congress, recommending a survey of the route.

THE ARCHITECTURAL EXHIBITION AT THE CENTENNIAL. — I.

ONE or two visits to the architectural room at the Centennial made us doubt whether we had not said more than we were justified in saying of the representative character of the exhibit, when two or three weeks ago we gave a paragraph or two of our summary to it. Several of our principal cities are not represented in it at all, especially in the West; neither Cincinnati, Chicago, St. Louis, nor San Francisco sending any drawings, if we remember rightly; and but one or two even of the Philadelphia architects, from whom most might have been expected, putting in an appearance, though several, it is true, were present in their works among the buildings, almost all of which, except the private buildings of exhibitors and governments, were the work of Philadelphians. In the sense, therefore, of including a comprehensive collection of examples from the active architects and the principal towns of the United States, the exhibit cannot be said to be representative; and it gives, on the whole, an impression of meagreness, belying the interest and activity which have since the war and until very lately characterized the work of the profession here. Still in another sense it may be fairly enough said to be representative, since it gives a tolerable indication of the better, the average, and the inferior work, that our architects have been doing, and also of the influences that are active in style, and even of their local distribution and variations. And certain peculiarities which appear in the display, slender and irregularly distributed as it is, typify conditions which architects will recognize as really existing in the profession.

For reference to these drawings, it may be said, the catalogue of the Art Department is quite useless, since not only are the contributions of the Boston and the New York Chapters of the Institute, which together form half or two-thirds of the whole exhibit, entered each in the gross as a single contribution, but many of the exhibitors who stand alone are not mentioned; and, to make the matter worse, a good number of the drawings are entirely without signature.

The three influences, English, French, and German, to which we owe our architecture, are pretty clearly shown and distinguished in the exhibition; and their local distribution is somewhat significant. The English influence, represented by modern Gothic of the Victorian type, predominates in the Boston work, and is very prominent in that of New York. The French influence is stronger in the New York section than elsewhere, though it leaves some trace also on the Boston and other Eastern work. The German influence is most marked in the Western work, just as we know that in fact the Germans are a more prominent element in the Western than in the Eastern communities. In the New York work we find the English, French, and German tendencies shown more on an equality than in any of the other, as the make-up of the city is more cosmopolitan in all respects than that of any other part of the country. In the Philadelphia contributions, the German element is prominent also, as it is in the city; but the representation is so incomplete that it cannot be taken as an index of what is done in the city. It is to be remembered, in taking into account the influences which act upon American architecture, that the work which bears a German character is almost exclusively the work of Germans. German architects come here already educated, as German mechanics do, and practise in the German way; but Americans who become architects acquire very little of the German habit in design. If they go abroad to study, it is almost invariably to Paris or London, commonly the former, almost never to a German city. If they study at home, it is commonly with Americans of French or English tendencies, seldom of German. Hence, as native architects come more and more into the majority, and the proportion of imported ones grows smaller, it is likely that the effect of German training on our building will diminish, and the English and French influences have the field more and more to themselves, till some distinctly American character asserts itself; which seems not likely to be the case very quickly.

These gentile characteristics mean, as things are now, pretty broad differences of style. Thus the mediævalists take their motives mainly from English work, the French influence is shown in its own neo-classic type, and the Germanized work is mainly (except for a few churches in mediæval styles) a version of Italian Renaissance. It is noticeable, that, of the two revivals in architecture of this century, one is only slightly evinced by the German work, and the other not at all. There are, as we said, a few mediæval designs among the contributions of the German school; but the classico-romantic school is unrepresented, and the countrymen of Schinkel among us design as if he and his followers had never been born.

As illustrations of what we have been saying, we may note that out of thirty-seven designs from Boston, taken in succession, twenty-seven were Gothic of one kind or another, and ten only were of classic descent; while of New York drawings out of sixty-three forty were Gothic, and twenty-three of the quasi-classic styles. Leaving out churches, to which a mediæval character is with us almost a matter of course, the New York designs would be pretty evenly divided between the classic and mediæval styles, while in the Boston the former would still preponderate decidedly. So it is, that, on the whole, English and mediæval design predominates, or seems to, at the East; that the central part of the country is divided between the children of mediæval and classical styles, between French, English, and German influences; and the West would seem, on the whole, to avoid mediævalism, and to be chiefly occupied with German architecture, which is of a classic or Italian type. If Cincinnati and Chicago were properly represented in the exhibition, they would change the aspect of it somewhat as regards the West; for in them the proportion of native architects is greater, and the fashions of work have been advanced as in the other large cities, so that both English and French influences are shown in them, and the movements of the day show their effect. But, apart from the cosmopolitan tendencies of these cities, we are inclined to think that the general character of our Western architecture is fairly indicated in the examples at the exhibition.

A parallel division may be seen in the rendering of the drawings. English architects tend greatly to pen-drawings; French and German drawings are mostly washed. So here, the works which show English influence in design show it also in rendering, and are more apt to be drawn with the pen: those which show a French or German pedigree are more often brush-drawings. We have before noted the coincidence, that mediævalists run to pen-drawing, and classicists to brush-work; and that also finds exemplification here. In the work from Boston, pen-drawings predominate; in that from New York, the pen and brush work is pretty evenly divided; while from west and south of New York almost all the drawings are in color. The French designs are subdued in color, and the German ones lively, as becomes their ancestry.

It is a common notion, that new countries are progressive and old ones conservative, and that a like distinction holds among the different parts of our own country, as in some respects it undoubtedly does. But in art it certainly does not appear to hold, either in its general or its particular application. In art, new countries lag behind old ones not only in skill, but in development of style and in fashion. Old countries are in matters of art metropolitan, and new countries are provincial, by what seems to be an inevitable law. The United States follow behind Europe in their fashions of art, as the newer communities always follow the older; and it is not strange to read, in a general exhibition like that at Philadelphia, that, while the older East follows a short distance behind the advancing movements of European architecture, the younger West is inclined to content herself with the forms that pleased the world a generation back.

Let not this last remark be taken, by the way, as an indication of our belief that a new fashion in art is of itself better than an old one, but simply as the record of an observed phenomenon, of which the relations are interesting for whoever will think them out. We have left ourselves no room to speak in detail of the individual designs shown in the exhibition: that must be left for another number.

THE FIRE QUESTION.—II.

READ AT THE EIGHTH ANNUAL CONVENTION A. I. A.,
BY P. B. WIGHT, PRESIDENT OF THE CHICAGO CHAPTER.

THE Boston fire struck just where confidence reposed: it commenced and ended in the best class of her business structures. Here was the spot where it was most natural to find a class of well-protected structures; and I believe I am not exaggerating when I say that these edifices comprised as good a lot of buildings for business purposes as could be or can be found in any one spot in any American city. A large number had been erected under the provisions of a new and carefully framed building-law, which was considered by many to be superior to that of New York, from which it was copied in many particulars. Yet the facts demonstrated that the fire-fiend could sweep off a city almost with the facility with which it destroys a prairie. Here was no such sprinkling of frame tinder-boxes as had been found in Chicago, to supply fuel for the destruction of her business edifices. The flames leaped from roof to roof and from window to window. While this disaster disclosed the almost entire absence of roof and window protection on the great stores and warehouses, it demonstrated, in a manner not to be questioned, the absolute necessity of fire-proof exterior protection to *all* business houses. I here use the word fire-proof in its true and literal signification; believing as I do that the complete protection of the exterior of business buildings is not only necessary for the preservation of all large cities, but is entirely practicable according to present well-known devices. To this I will allude in detail further on.

Perhaps no fire has ever excited so much comment as that which occurred about a year ago in the building known as the "Pantech-

nicon" of London. Here was a building literally destroyed by its own contents. It was not only built of incombustible material, but was divided into compartments by fire-proof doors. Here the long-possessed consciousness of security had made the watchmen careless. The doors were left open; and the fire raged over a large part of the building, everywhere finding fresh food, and in the end producing total destruction. This building would be comprised within the first class of what I denominate as fire-resisting buildings. It was doubtless fire-proof in the exterior, but that availed nothing against its contents. Here was an evident failure of the fire-resisting construction in doing just what it set out to do; and it can be added to the list of similar failures above mentioned among buildings of the first class.

I will now take up the consideration of the two classes of fire-resisting buildings separately. In my remarks in 1869, attention was called to the uselessness of attempting to build certain classes of warehouses or wholesale stores, heavily stocked with combustible goods, entirely of non-combustible material; or, in other words, trying to make them fire-proof. My opinions on that subject have been more than borne out by experience; for we have seen such buildings swept away by fires both from within and without. In the latter case, it has been shown that there was a general neglect to consider the combustible nature of the adjoining buildings in crowded cities. I will take it for granted, therefore, that these buildings will be generally of the second class for some time to come. We will consider this class of structures first in order, inasmuch as it is by far the largest, and the one to which public attention is now so generally directed, and to which the building-laws are intended to apply.

I will confine myself to the consideration of buildings in crowded cities. As said above, they must be secure; first, as to the exterior, and, second, as to the interior. Exterior protection is the most important, and therein rests the greatest security against general conflagrations. It is, moreover, a result not difficult to accomplish.

The first essential is, to have walls of sufficient size. Where walls are faced with stone, a destructible material, the backing should have sufficient resisting power independent of the stone. Thus the stone facing may be destroyed while the interior remains intact. If flat roofs are used, front and rear walls should be carried up two feet above roof-line, whatever the material of the cornices. Party-walls for flat roofs should be carried up not less than five feet above roof, and pierced with embrasures having bevelled cheeks. Party-walls above roof should be sixteen inches in thickness. It is poor economy to carry a sixteen-inch wall to the roof-joists, and to reduce it four inches above. Where steep roofs are employed, there should be a sufficient fire-proof filling under the covering material. They are not dangerous when thus treated. The old method of using rolled beams with brick arches flushed up level on top with concrete, and then covered with any ordinary weather-protector, is undoubtedly effective for *exterior* protection against fire; but is not to be considered in connection with buildings of the second class, on account of cost. I assume that wooden joists or rafters will be used. In that case, the most simple process for flat roofs is, to make first a covering for fire-protection, and above it a covering for weather-protection. The simplest way of accomplishing the former is, to cover the rafters with common boards tightly fitting, then strip with 2 x 1 inch strips set on edge, and fill in with concrete deafening two inches thick. The fire-proof roof is then completed. The cement is fire-proof absolutely. The strips cannot be burned to an appreciable depth, as has been found by repeated experiments. In place of concrete, bricks may be used, laid flat in cement, in which case the strips will have to be $2\frac{3}{4}$ inches high. The strips in all cases form the basis of the weather-roof, which may be of boards covered with tin, or any of the patented compositions, or saturated paper, or canvas nailed to the strips and coated with composition and gravel. This system of roofing is to be incorporated into the new building-law of Chicago, and is to apply to all buildings more than forty-five feet high, as suggested by the writer. It provides for a double roof on every building. Numerous as have been the attempts to combine in one material the properties of a fire-proof and water-proof roofing, none can thus far be said to be entirely successful. By using the double roof, all patented inventions may yet be tried, assurance of safety from fire being given by the underlying fire-proof covering. A roof of tiles would undoubtedly cover both desiderata better than any other yet known. It is an old and well-tried device: yet there is no general market for tiles at the present time; and considerable risk must be taken, on account of the chance of using tiles not fully burned.

When the roof is steep, and covered with slate, I have found the best treatment to be the following: First, deafen between the rafters in the usual way, the top of deafening-boards being one inch below the top of rafters. Nail upon the rafters horizontal strips of one by one inch stuff with spacing to suit the slates: these form a grating to hold the concrete until it sets, and a nailing for slate and tiles. Then flush with concrete to the top of the strips, into which nail the slates. By this method the strips are completely embedded in concrete, except where they cross the rafters, and the whole device is even more secure than a two-inch course of concrete on flat roofs. But there is more reason that it should be secure, inasmuch as such a roof is more exposed to a neighboring fire. Mansards can be made safe by this process, which is not only easily done, but inexpensive, and dispenses with the use of metal for rafters.

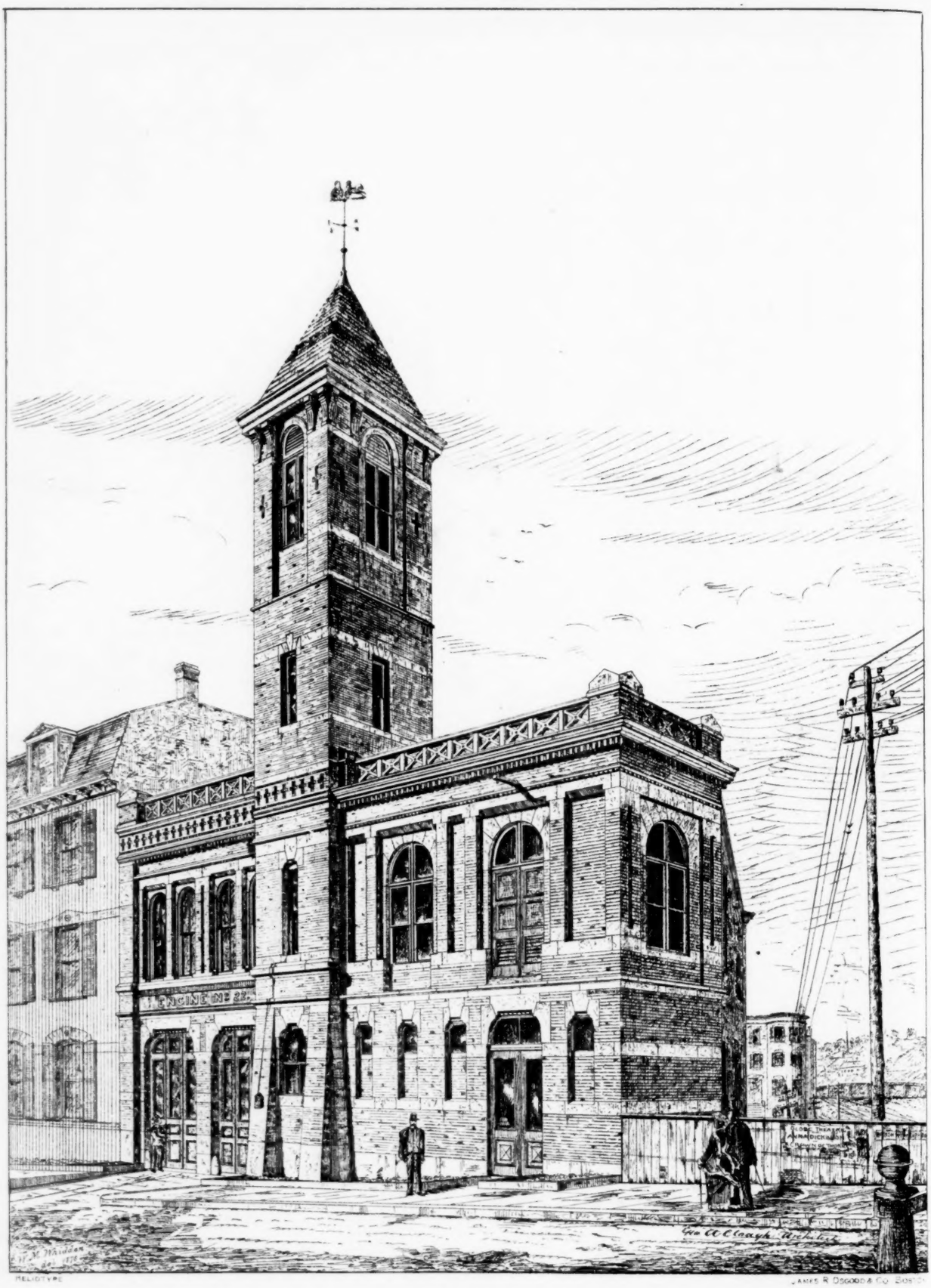
All scuttle-doors should be made of iron, and all combings around scuttles should be built around with hard brick. Skylights should be avoided if possible. If they must be used, they should be either of bull's-eye glass in iron frames, or iron bars carrying narrow strips of glass not less than one quarter inch thick, and covered with heavy wire netting. Even these cannot be considered absolutely secure unless there are provided perforated pipes on the outside, from which water can be ejected by force from below. All combings for skylights or other structures built up above the line of roof, and all cheeks of dormer windows, should be covered on the outside with four inches of hard brick laid in cement after the fashion of the galvanized buildings in Western cities. Roofs must of course be strong enough to carry this additional weight. Gutters for steep roofs should be entirely of incombustible material; and the cement filling of roofs should in all cases be connected with exterior brick walls. All dormer windows where necessary should be built of brick, or have so little stone in them that their destruction would not make any opening to the interior. All dormer windows should have outside or inside shutters, or both, which should in all cases be made of two thicknesses of iron, and, if on the inside, should be secured directly to the brick-work. Shutters for dormers should be more perfect in workmanship than those for windows in walls below, as they are always more exposed. All sheet metal, or wood covered with metal, for dormer windows or their projections above roofs, must be discarded.

It is generally conceded, that all rear windows of buildings of all classes should have iron shutters. The prejudice against iron shutters on the fronts of buildings is simply an absurd squeamishness of those who imagine that their artistic effects would be thereby interfered with; and has been encouraged by those who would endeavor to keep down the cost of city buildings without regard to their safety. An architect of ability will not fail to apply the remedy without doing violence to good taste or artistic effects, as soon as the necessity is recognized of having iron shutters on street-fronts. Now we put shutters on rear windows without dangerous exposure, and leave the windows open on streets from thirty to forty feet wide, with buildings from sixty to eighty feet high on both sides; as, witness, on Pine, Cedar, Nassau, and New Streets, in the city of New York.

Admitting that rear windows should have iron shutters, I will only say that they should be good and strong ones, whose qualities should be non-conductability and stiffness. The first quality is got by using two thicknesses of iron with an air-space. There are several forms well adapted to general use. Stiffness is to be obtained by heavy welded frames and good fastenings secured in as many places as possible. For the great danger to iron shutters is from warping, and therefrom the admission of fire at exposed corners even when the shutter is a non-conductor of heat.

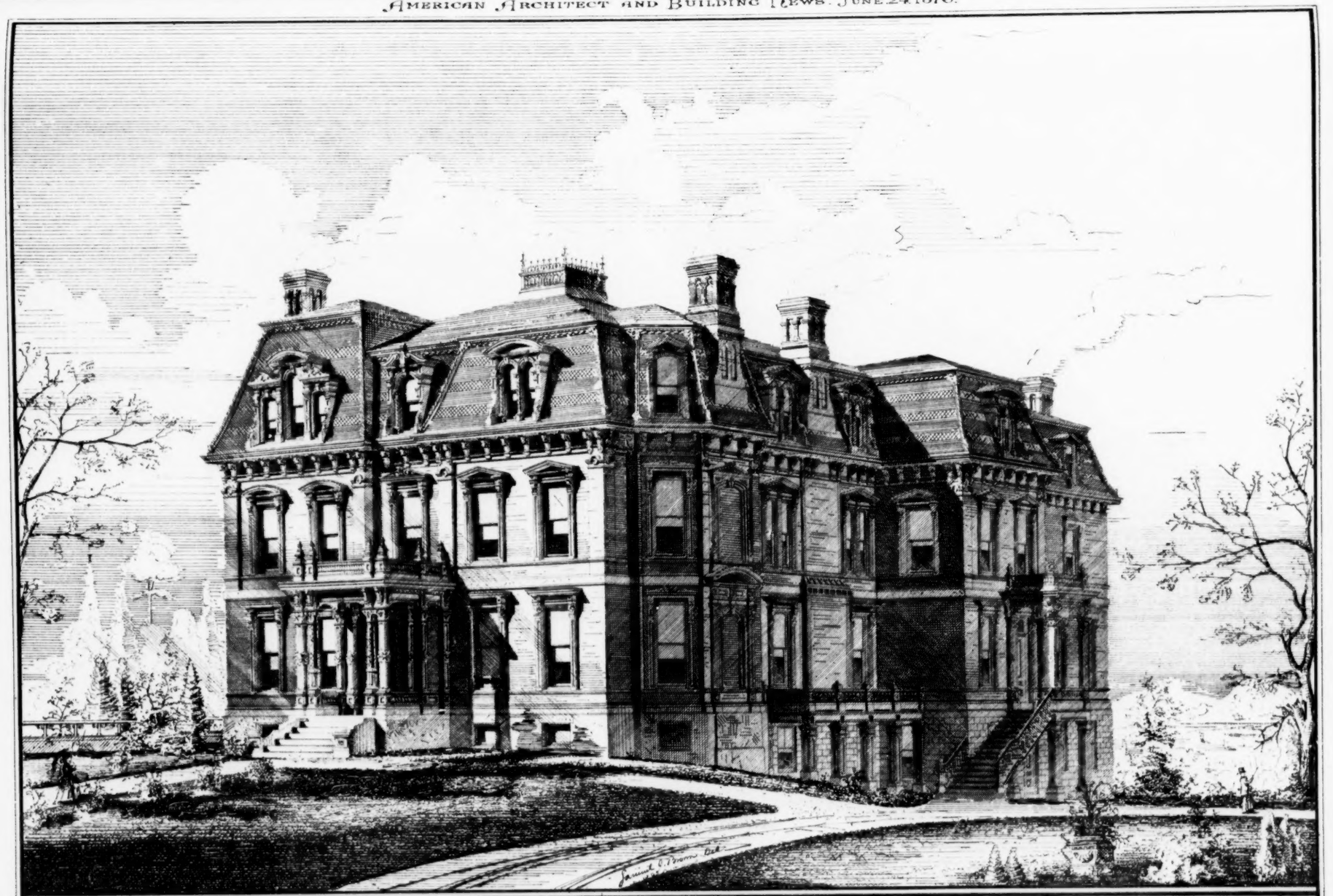
Shutters for front windows require more or less care according to the width of the street. The rolling shutter answers every purpose, but is too expensive for general use. The single sheet steel shutter is a good substitute, and has the advantage of taking up but little room. Inside folding iron shutters should be in all cases secured to the brick jambs. A recent application of the old device of the lazy-tongs to exterior louvres has been made by Hayes Brothers of New York, and has many points of excellence. It will answer the purpose of fire-proof shutters when down, and Venetian awnings when raised half-way up. For plain stores and warehouses, iron shutters may be hung on the fronts as on the rears of buildings.

The above suggestions cover the main points of exposure in most business edifices. It remains now to consider the second consideration, inside protection, which is by no means so easy an undertaking. The first is of the utmost and I may say sole importance in regard to the safety of large cities from fire. Still no one



ENGINE HOUSE ON DARTMOUTH STREET — BOSTON.

ERECTED IN 1875

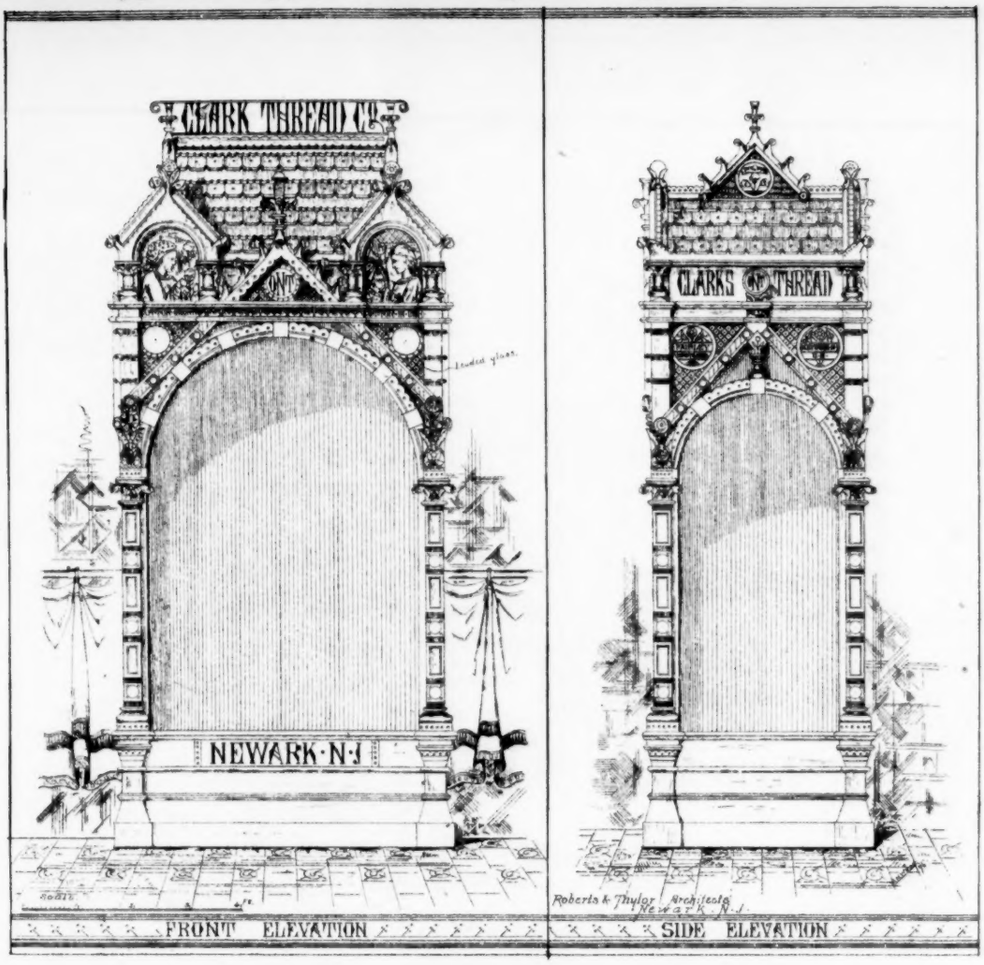


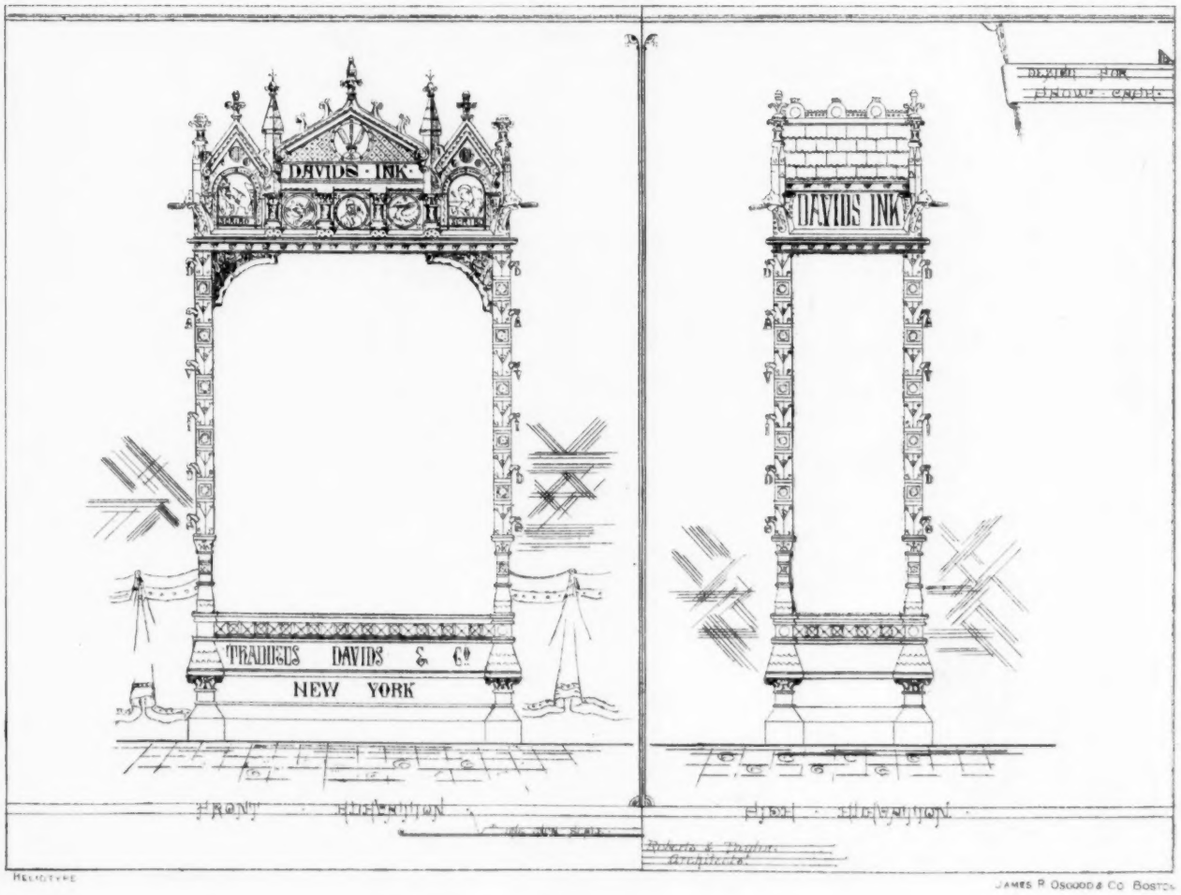
HOUSE FOR F. AYER ESQ. LOWELL, MASS.

S.S. WOODCOCK, ARCH'T.
BOSTON, MASS.

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON





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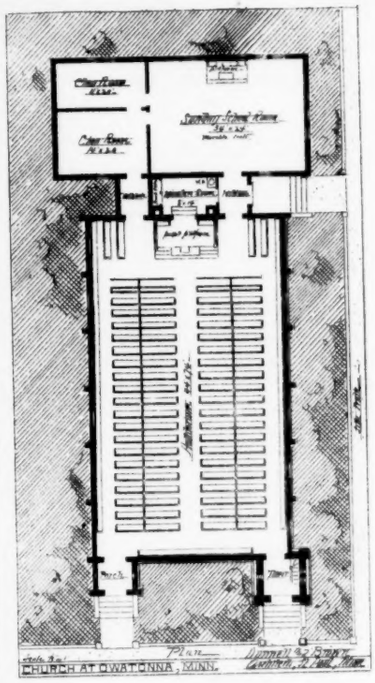
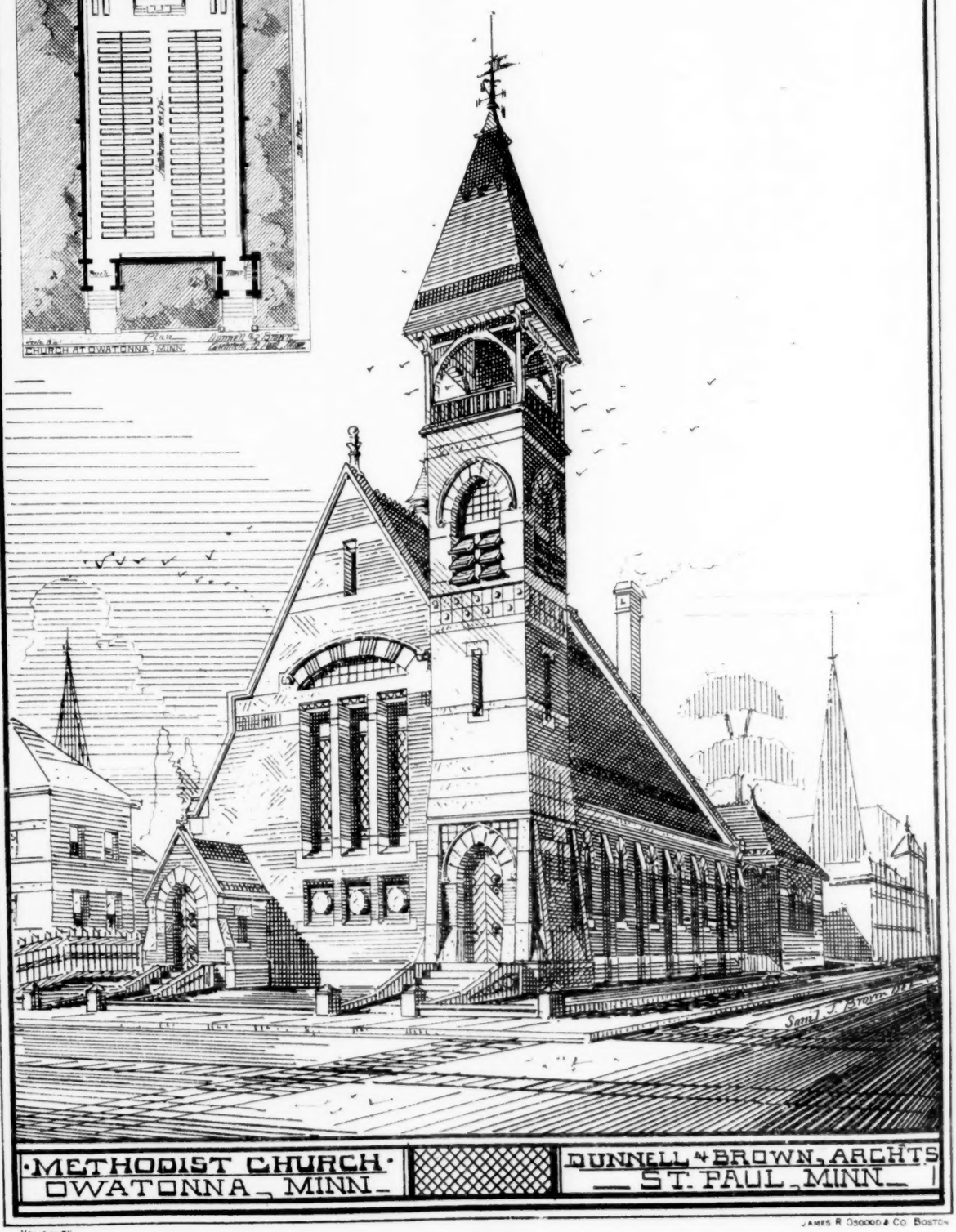
AMERICAN ARCHITECT AND BUILDING NEWS. JUNE 24 1876.



CHURCH AT OWATONNA, MINN.



METHODIST CHURCH
OWATONNA, MINN.

DUNNELL & BROWN, ARCHTS
ST. PAUL, MINN.

HELIOTYPE

JAMES R OSGOOD & CO. BOSTON

should be allowed to build a tinder-box, even though every one else is defended against it.

THE ILLUSTRATIONS.

ENGINE-HOUSE ON DARTMOUTH STREET, BOSTON. MR. G. A. CLOUGH, ARCHITECT.

THIS building is situated on Dartmouth Street, near the crossing of the Providence Railroad. The elevations are of face brick with sandstone trimmings. On the first floor is an apparatus-room fifty-six by thirty feet, a stable containing seven stalls, a work-room, dressing-room, and a large closet. The second story contains a dormitory forty by twenty-one feet, a smoking-room, captain's room, bath-room, and over the stable a hay-loft. The height of the hose-tower is seventy-four feet. The building was completed in July, 1875.

SHOW-CASES AT THE CENTENNIAL EXHIBITION. MESSRS. ROBERTS AND TAYLOR, ARCHITECTS.

The show-case for Messrs. T. Davids & Co. is built of black walnut. The other show-case is built of cherry.

METHODIST CHURCH AT OWATONNA, MINN. MESSRS. DUNNELL AND BROWN, ARCHITECTS.

This church, built of brick with freestone trimmings, and covered by an open-timbered roof, is to be erected this season. The interior is finished in pine, the walls tinted and frescoed.

HOUSE FOR F. AYER, ESQ., LOWELL, MASS. MR. S. S. WOODCOCK, ARCHITECT.

This is a brick house with dressings and portico of blue freestone from Nova Scotia, and granite basement and underpinnings. It measures 96 by 61 feet. Upon the main floor are the drawing-room, library, sitting-room, dining-room, kitchen, music-room, smoking-room, and other smaller rooms. On the second floor are six chambers with their dressing-rooms. On the third floor are ten chambers. Each floor communicates with the baggage-elevator.

ICE-RINKS.

As is well known, because the isothermal line that passes through the Middle and New England States passes to the north of Great Britain and France, the temperature of these countries does not often fall below the freezing point, and the formation of thick ice, especially in the neighborhood of London and Paris, is of rare occurrence: therefore the delights of a day's skating are unknown to the mass of Londoners and Parisians. But they do know that skating is an enjoyable and exhilarating exercise; for they have the occasional opportunities of seeing American skaters who hurry to the ponds and lakes as soon as it is known that ice strong enough to bear has formed. Nature having denied them the opportunity of enjoying this exercise in the usual and legitimate manner, they have introduced the use of skating-rinks, — not the cold, damp, and cheerless rinks that we are familiar with, but bright, cheery, well-aired rooms, in which ice is replaced by an even layer of cement or asphalte, and the clear ringing sound of the steel skate-blade is replaced by the rattle of the wooden-wheeled skate. These skating-rinks have, in London, divided popular favor with revival-meetings; while in Paris they have only not diminished the popularity of the numerous *balles dansantes* because they have been very generally combined with them. Although this new kind of skating-rink is less injurious to the health than the old kind, in that there is less danger of catching colds and lung diseases, medical authority decides that injuries occasioned by falls upon the cement or asphalte surface are more likely to be serious, than when the fall is upon real ice; this is because of the greater density and almost absolute non-elasticity of the artificial surfaces.

An Englishman, Mr. John Gamgee, has at length succeeded in perfecting a process by which a surface of ice is produced by artificial means. The idea is not original with him: indeed, several different processes of effecting the same thing have been patented by Americans, as well as by Englishmen. It was only last year that Messrs. West and Du Vallon patented an ice-rink, the floor of which was supported upon iron girders; the spaces between being used for the production of the necessary cold.

In the different patented processes of producing artificial ice, the air-pump and the evaporation of sulphuric ether have played important parts; but it has always been found easier to produce cold than to utilize it when once produced, because of the difficulty of conveying it to points distant from the point of production. This difficulty has been overcome by Mr. Gamgee in a really scientific and practical manner, as we shall explain farther on.

The water which is to be converted into ice is about three inches deep, and offers a surface measuring twenty-four feet by thirty-seven feet, in which are placed a series of copper pipes of oval section, which measures two and one-half inches in its long axis, and three-quarters of an inch in its short axis. These pipes are connected at the ends, so as to form one uninterrupted system, affording passage for the freezing-mixture which runs down one pipe, and back through the next, throughout the whole series. The circulation is kept up entirely by gravitation, the flow of the freezing-mixture being kept up by the head of the liquid in the tank at one end from which it passes into a large transverse pipe, running along one end of the system of pipes already spoken of, and which are fed directly from it; another transverse pipe receives the liquid after it has passed through the pipes, and returns it again to the tank, the return-pipes being laid at a lower level than the others.

The pipes are laid upon a non-conducting stratum composed as follows: they rest immediately upon a layer of tarred cow-hair, which forms a water-proof felting half an inch thick, which in turn rests upon a level flooring of two-inch planks; next below this is another layer of cow-hair six inches thick, which rests upon a layer of loose dry earth four inches thick; last of all is a layer of concrete.

In Mr. Gamgee's method, a large air-pump, which is worked by a steam-engine, is an important factor for the production of cold: the other factor is not, as is usual, ether, but sulphurous acid. We have not been able to discover the exact method in which the sulphurous acid is employed; but we suppose that the process is based upon those properties of true gases, compressibility and elasticity. Sulphurous acid is one of the gases which is most compressible, it being readily converted at a moderately low temperature into a liquid, by a pressure of three or four atmospheres. While undergoing this condensation, the gas loses some of its heat which it must regain, when, by the removal of the pressure, it is allowed to assume its original gaseous condition. The gas is condensed in a condenser, which is composed of a wooden tank filled with fresh water, in which is inserted a system of double copper pipes, inserted one within the other. The sulphurous acid is introduced into the spaces between the outer and inner pipes, while cold water passes through the inner pipes, thus producing the necessary coolness which, with the pressure, is to convert the gas into a liquid. The liquid, once produced, passes probably from the conductor to what is called the refrigerator, which is said to be also filled with tubes; here we suppose the pressure to be removed, and the liquid allowed to re-assume its gaseous condition; but, in so doing, it must re-acquire its original temperature; and, as it cannot obtain that from its own substance, it must withdraw it from other substances whose temperature is lowered in proportion as the same substance is brought in contact with fresh bodies of the volatilizing liquid. We suppose, then, that the tubes of the refrigerator are surrounded by what is spoken of as the freezing-mixture, which is nothing more nor less than equal parts of glycerine and water, from which the heat is rapidly extracted by the re-conversion of the liquid contained in the tubes, until the temperature of the mixture is so lowered, that, were it not for the presence of the glycerine, ice would be produced in the refrigerator, — for the temperature is lowered to several degrees below zero. The cold once produced, the next thing is to preserve it, and to convey it to the points where it is desirable to apply it. This is done by withdrawing it as fast as it is produced from the refrigerator, and storing it in the large tank mentioned above, from whence it passes into the system of pipes underlying the sheet of water to be converted into ice. To show the value of this mixture of glycerine and water, as a vehicle for conveying the cold, it may be said that, after having made the tour of the system of pipes, its temperature is still twelve degrees below the freezing-point, so that there is no portion of the water-basin which is not at all times exposed to a degree of cold more than sufficient to produce ice. The ice surface so produced is said to be exceedingly firm and fine in texture, and, moreover, very hard. Whether this hypothesis be correct, or not, the process is said to be a perfect success, and the production of ice by this method not so expensive as to preclude the chance of profit; for it is said a rink of this sort can be built for about twenty-two dollars per square yard. The inventor asserts that he can guarantee a perfect sheet of ice, by his process, even under a tropical sun.

It is said that this system which employs sulphurous acid as an

agent gives double the amount of cold that is given by the methods which are based on the evaporation of sulphuric ether. The only objectionable feature in the process seems to be the possibility of the escape into the hall of the fumes of sulphurous acid, which of course has to be manufactured on the spot.

NOTE. — Since this article has been in type, we have seen in the Scientific American for June 24 a notice of M. Raoul Pictet's method of freezing water by employing anhydrous sulphurous acid in a very similar manner.

CORRESPONDENCE.

NEW YORK.

THE new Church of the Paulist Fathers, R. C., to be known as the Church of St. Paul the Apostle, is the latest addition to the ecclesiastical structures of this city. The building is to stand on Ninth Avenue, between Fifty-ninth and Sixtieth Streets, just now a rather forlorn, out-of-the-way corner of the city. The site is two hundred feet wide by four hundred feet deep, and will be pretty well covered by the building. There is a rock bottom under the whole piece, and upon this the foundation walls will be laid. Mr. Jeremiah O'Rourke has here designed on a grand scale the most spacious church edifice in the city certainly, and perhaps in the country. The design is in the French Gothic of the thirteenth century. The façade shows a pair of flanking towers, with a great rose-window between. The plan has a broad nave and narrow aisles, with side chapels, and a most roomy chancel. The figures will give some idea of the relative disposition of parts. The front, from outside to outside of the towers, will measure 153 feet; the total external width across the nave and aisles will be 121 feet; the total external depth, 285 feet; front towers, forty feet square at base, with a thickness of wall of nine feet, and a height to the cross of 320 feet. The position chosen for the church is an elevated one; and, with towers of this height exceeding any thing now erected, the new church will be a conspicuous object in the city's landscape. The walls will be built of the hard blue stone quarried from the building-site, faced externally with red Connecticut granite in courses, all laid in cement mortar. The basement, extending under the entire church floor, will afford seatings for two thousand people. It is the intention to have this floor finished, and the floor of the church laid, as soon as possible, in order that it may be put to use pending the completion of the church proper. The floor of the church will be of rolled iron beams with brick arches turned between them, making it a nominally fire-proof construction. This basement will be amply lighted, setting well up above the grade-line. The nave of the church proper is sixty feet wide, one hundred and eighty feet long, and one hundred feet high inside. The chancel is a continuation of the nave, being of the same width and height, and sixty feet deep, with an apsidal end. The nave is flanked on either side with aisles and chapels along its entire length. This unusually wide nave and commodious chancel forms the main feature of the new church; and, according to the architect's comparison with churches of similar plan and style, is found to be nearly one-third wider than the widest nave in this country or in Europe. This immense space affords a splendid auditorium, entirely clear of obstructions, and having a brilliant perspective effect. The nave columns are to be of polished granite, or, it may be, of cast iron, made as slender as is consistent with the weight to be carried, and as offering the slightest obstruction to the view of the sanctuary from the aisles and chapels. Of these side chapels, there will be twelve, each twelve by twenty feet; while two large chapels on either side the sanctuary, dedicated respectively to the "Blessed Virgin" and "St. Joseph," will be twenty by twenty-five feet in plan. The sanctuary, or chancel proper, will be fitted up with three hundred and twenty hardwood carved stalls for the fathers and choristers; the Gregorian chanting, which is the music exclusively used in this church, requiring a large body of singers for proper effect. Back of the high altar will be the great organ, thus bringing the singers to their proper place near the altar, instead of being placed with the organ, in a loft at the other end of the building, over the grand entrance, as is the usual custom. The interior finish has not been decided upon. The circular window over the front porch will be thirty-four feet in diameter, filled in with moulded stone tracery. In the apse will be seven large windows, each eleven by twenty-five feet. The other windows will bear a proportion to the magnitude of the building, and will be glazed throughout the building with cathedral stained glass, of a rich color and special designs. There will be five entrances, three on the front, and one on either flank. The central opening will be twenty-five feet high by sixteen feet broad, and the others, sixteen feet high by eight feet broad. The pews are divided by five passages, the central one ten feet wide, and the others seven feet. The church will furnish twenty-five hundred sittings, with standing space for as many more. Ample provisions will be made for heating and mechanical ventilation. The roofs will be of wrought iron construction, tie rods, and angle iron strips; and, upon this support, slate covering will be placed. Within, the walls will be plastered, the ceilings groined and finished with moulded ribs and carved bosses, springing from attached columns on the side walls. The cost of the entire structure will be about half a million dollars; and the time for its completion, from four to five years. The corner-stone of the church was laid June 4, Whitsunday.

Another new church is the Church of St. Agnes. This rests on Forty-third Street, near Lexington Avenue. The work was entered upon in July, 1873; and from various causes the building lagged, until the corner-stone was laid but a few days since. The building, however, is well advanced; the basement story being completed, the rear wall ready for the jack-rafters, and the side walls completed up to the window-sills. The church stands between high brick buildings, and hence was cut off entirely from any side light: to get over this obstacle, the aisles were made very wide, and top-lights introduced. The ground plot is one hundred and five feet wide by one hundred feet deep. The actual front of the building is ninety-six feet, with an interior width of eighty-six feet eight inches. The nave is narrow, and on either side are arranged double rows of aisles; an arrangement rarely met with in small-sized churches. The height to the ceiling in the outer aisle will be nineteen feet, and in the nave sixty-six feet. There are five bays, each bay having a triplet window filled with stained glass opening into the narrow passage along the side of the church; the principal light coming through the clerestory windows. The organ is placed over the vestibule, which, with the baptistery near the front entrance, will be handsomely tiled. The ceiling of the church will be groined in plain rectangular vaulting, and the walls furred off with iron lathing. Behind the altar a window 16 x 24 feet will face another in the front of the church, 20 x 32 feet. The roof above the nave will be slated, but the aisle roofs will be of sheet iron carried on iron framework. The basement of the church will be entirely of granite; and the remainder of the exterior, of Philadelphia selected brick laid in red mortar with Ohio stone trimmings. The two side-towers will rise to a height of one hundred and twenty-two feet, with louvres rising high above. The entrances are three in number, the central one nine feet wide, with most elaborate doors. The capacity of the church is placed at fifteen hundred seated, and the cost at $110,000. The architect is Lawrence J. O'Connor, who is the architect of several church edifices in this city and vicinity.

With the newly projected church of St. Francis Xavier, and a small wooden chapel in the upper part of the city, the believers in the Roman faith are just now taking advantage of low prices and dull times, and spending their accumulations of years of plenty.

Interest is revived in the Albany Capitol matters, by the appearance before the Commissioners of the Land Office, — who are the working representatives of the State government touching the new Capitol, — of Messrs. Eidlitz and Olmstead, now the consulting architects. The whole matter is resolving itself into a quiet diplomatic contest between Messrs. Eidlitz and Fuller, as to who shall control the erection or completion of the building, and thereby determine whether the ultimate completion shall be in the Renaissance or Romanesque style. Mr. Eidlitz is progressing also with his plans for the completion and general utilization of the New York City Court-House. It is a hard problem to work out; but the sketches place upon its flat roof another story in Gothic, and a great dome treated with Gothic details. What the result of the job will be, it is hard to say. This court-house had been turned into such an avenue of approach to the city treasury, and so vast were the pieces of thievery committed under pretext of contract upon it, that the very mention of any further expenditure upon the ugly pile will raise an outcry from a city full of indignant tax-payers. The mention of this ill-fated court-house recalls the Kellum suit, brought by Hannah Kellum, the widow of the architect of the building, the late John Kellum. The suit was characteristic of Kellum, even though dead. As A. T. Stewart's architect and real-estate man, he secured a great influence over the millionnaire, and executed for him the buildings which mark his want of taste as an architectural critic and judge. Beyond the Stewart work and this court-house, it is difficult to recall what Kellum ever did do. From a very poor carpenter's foreman, he suddenly blossomed into an "architect," and rushed on into a goodly fortune if not into much renown. Blackballed by the New York Chapter of

the Institute, he failed to comprehend that receiving fees from mechanics as well as clients might prove a proper ground for rejection. Even while the trial was in progress, a committee of the Board of Health were at work on an examination of the heating and ventilation of the building, and found blunders of construction which should disgrace the merest tyro in an architect's office.

THE MESSRS. LONG, ARCHITECTS.

BALTIMORE.

EDITOR OF AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — The account of the life and experience of Mr. B. H. Latrobe, published in the January 29th number of your magazine, was especially interesting to us in Baltimore, who have the pleasure of acquaintance with some members of the Latrobe family; and it has induced me to send you a short biographical sketch of my grandfather and uncle, the Messrs. Long, who, although never the prominent men in public affairs that Mr. Latrobe was, yet held, in their day, an important place in the ranks of our profession, and equally in the affection and esteem of the Baltimore people. R. Cary Long, sen., who lies buried in the graveyard belonging to the old historic parish of St. Paul's, — St. Paul's being the church to which he was especially attached, and on which he spent a portion of his income during life, — was born in the year 1772, in Maryland, having an historic lineage on both sides of his ancestry. His father having died when he was quite young, and his mother having married again, — this time to a very unfeeling and ill-mannered stepfather, — induced him to leave home entirely, and seek the city for employment, tradition says, with his whole property contained in a pocket-handkerchief slung over his back by a cane. On his arrival he took the first opportunity of work that offered, apprenticing himself to a carpenter; but, from the bench, his early training and innate superiority raised him to the captaincy of the architects of Baltimore.

To him our city owes its gas-works, it being the next city to London thus illuminated. He corresponded with the London company, and superintended the construction of the works here. Through his influence, it is said, the illuminating gas was first introduced into Boston; and his correspondence with the English board of works was, for some time, in the hands of the Philadelphia company. The principal buildings designed and erected by him here were the second St. Paul's Church, destroyed in 1854, and since rebuilt by Mr. Upjohn on the old foundations; the Holliday-street Theatre, burned in 1873; the old City Hall; St. Peter's Church, the site where it stood being now covered with large iron warehouses; the Baltimore Library; the Mechanics' Bank; the Patapsco Bank; Patapsco Institute at Ellicott's City; the present court-house, now about to be torn down; the old city jail; the Union Bank, since destroyed, its old and firmly built walls causing, in the demolishing, much trouble and labor; and various private dwellings, besides other public ones which I am not able to remember or gain any knowledge of.

The latter years of his life were mostly given to civil engineering; and the laying-out of Canton, on the outskirts of Baltimore, was his last work. He died in 1835, at the age of sixty-three, beloved and honored by all classes for his unswerving integrity of character, his cordiality to equals, his kindness to inferiors; and was lamented as a public loss to the city.

There is a curious fact in my grandfather's life, which, being taken for what it is worth, certainly occurred, and so occurring shows the remarkable effect of matters weighing on one's mind. When St. Paul's was in progress of erection, he was living at his country place on the outskirts of the city. He had left the church one evening, when the inside finishing was being done, and men were working on the organ gallery, giving express orders that no work should be done after night, as candles are not the safest things to be near woodwork. During the night he dreamed in three consecutive dreams, waking after each, that the church was on fire. After the third time, then about two, A.M., the subject weighed so heavily upon his mind, that he determined to saddle his horse, ride into town, and see if there was any cause for this nightmare. What was his astonishment to find a light shining through the windows! Some careless workman had disobeyed his instructions; and when the candle was discovered it had burned down in close proximity with the woodwork.

I am sorry not to be able to give much fuller details of his work and experience, which no doubt, considering the era of their occurrence, must have been very interesting. But it is very hard to unearth facts, where there is a lack of records of any sort; and, in all the various changes that have happened to the family since his time, all his drawings, papers, sketches, &c., have vanished, and there is absolutely nothing that one can linger over, and weave an interesting life from.

R. Cary Long, jun., was born in Baltimore, in the year 1810. He was an only son, and, until the age of twelve years, gave no promise of any extraordinary talent or intellect: on the contrary, at school, he was looked upon as rather a dull fellow. His teacher, a petty tyrant as he would be considered in our day, was the best of his time, and ruled by fear instead of love. On his death, my uncle was sent to St. Mary's College, a Roman Catholic institution, of which the Rev. Mr. Wheeler was then president. Under the kindly fostering care of the clergy of this establishment, the mind of young Long rapidly developed; and here his graduation took place in his sixteenth year. His favorite study was mathematics; and in it he attained such proficiency, that, upon the death of the professor of that branch, it was thought by the faculty, that Mr. Long was the one in the college most capable of filling the chair: to the professorship, however, the Fates had not ordained him. His father having from his boyhood intended him for *his* profession, his studies in the languages at college were almost completely confined to the modern ones, preparatory to a tour in Europe, so that he received no diploma on his graduation; but in after-years the college conferred upon him the title of A.B. On quitting his studies, he started for an extended trip in the North; and his father, finding a good opening for him in an architect's office in New York, left him there, intending, in a short time, to send him abroad to complete his education. The cholera soon after, however, appeared on the Continent: this delayed his visit; and his father's death, shortly following, induced him to give up entirely his notion of going abroad, and gave him opportunity to enter at once on his meditated profession in Baltimore. He almost immediately became popular, having exquisite taste in design, great knowledge of architectural history, an immense energy, which induced him to go even so far as to send competitive plans for the new English Parliament Houses, with but the faintest hope of success. He was a poet, as is shown by one lovely gem I have in my possession; a sparkling wit; a painter of some merit; a literary man, as is attested by his lectures on art; and such an entertaining man in society, that dinner-parties were hardly considered complete without him. In the course of my professional experience, I have found but one opinion among the workmen who have known him: they had in him a friend and a sympathetic helper of youth; and some of our largest business firms owe their start to his help and countenance. He had the happy faculty of adapting himself to any society, being as perfectly at home in the workman's cottage as in the fashionable parlors of the city.

Among his designs here are Mt. Calvary Church, St. Alphonsus, a vaulted church, built when vaulting was little known; and the exquisite front of St. Mary's Chapel. He built also a church at Westminster, and a cathedral at Natchez. Among his public buildings are the Law Buildings, the Record Office, a plain but imposing granite structure, the old American Office, and the Deaf and Dumb Asylum at Staunton, Va. His reputation became more than local; and, to avail himself of more extensive opportunities, he removed to New York, and was in the full tide of a successful business career, when it was suddenly brought to a close by his old enemy, the cholera, in his thirty-ninth year, while on a visit to a client's house in New Jersey.

Yours, &c.,

T. BUCKLER GHEQUIERE.

NOTES AND CLIPPINGS.

FALL OF BUILDINGS. — There must be something wrong in the building-trades at Philadelphia, or buildings would not fall down there as easily as they do. In less than three months, four buildings have fallen, causing the instant death of four men, and the maiming of sixteen others. The latest accident was the fall of the rear wall of the central house of a new unfinished block of three houses situated upon Forty-second Street. The cause of the accident is supposed to have been poor bricklaying on insecure foundations. The builder employed was also the owner.

ACCIDENT IN A CHURCH. — On Sunday, the 11th inst., while service was being held in the unfinished Catholic Church at Houtzdale, Penn., the gallery and the floor beneath the gallery gave way, precipitating the occupants through a distance of twenty-two feet. Upwards of thirty people were injured; but, strangely enough, the only person killed was the contractor for the building. Nothing is said as to the cause of the accident.

LONG ISLAND CITY. — The Supervisors are preparing to issue bonds for one hundred thousand dollars, for the completion of the new court-house.

CINCINNATI.— One of the new State laws, which orders that all new buildings or alterations of buildings shall be entered at the office of the Board of Public Works, has enabled the Cincinnati Commercial to publish a three-column list of new buildings erected, and alterations made at Cincinnati, during the fourteen months ending June 1, 1876. From this it appears that four hundred and fifty new buildings, mainly single structures, have been erected at a total cost of about two million thirty thousand dollars, being an average of four thousand five hundred and eleven dollars per building erected. The greater part of these are dwelling-houses of moderate cost, a few large buildings only helping to raise the average. About two hundred and twenty thousand dollars were expended in additions and alterations. The greater part of the buildings were built of brick, a few only of stone; showing, seemingly, that the wealthier classes had not been particularly active in house-building during the period under consideration. If it were not that the frame-buildings, which form one-fifth of all buildings erected, are found in only three or four of the twenty-five wards of the city, and may therefore be supposed to be outside the fire limit, one would be led to question the excellence of the Cincinnati building-laws.

THE NEW CAPITOL. — A stone-cutter writing to the New York Times asks: "Why is the State paying ten thousand dollars a year to a superintendent, when he has nothing to do six months of the year? We have worked one month on the building since the 24th of last December, when they knocked us idle. 'What are a thousand deaths like thine to a fame like mine?' exclaimed Parrhasius to his tortured victim. So say I, what are a thousand hungry men, women, and children, that they should be thought of when the time is required to further an aspiring politician on the road to fame?"

YALE COLLEGE.— A correspondent of the New York Times fills a column of that paper by writing of the interior decorations of the new chapel of Yale College. We gather that the chapel, which has cost about two hundred thousand dollars, was the gift of a New York gentleman, but find in the description of the building no mention of the architect's name.

ABATTOIR. — The new abattoir for New York, of which mention was made a short time ago, is to be three hundred and seventy-five feet long, and will cost above three hundred thousand dollars.

THE NEW INDEPENDENCE CLOCK. — An exchange states that the clock which is to be presented to the city of Philadelphia by Mr. Seybert of that place, and which will be placed in the tower of Independence Hall, has been finished. It weighs altogether six thousand pounds, the pendulum rod and ball alone weighing nearly seven hundred pounds. One of its combinations is so adjusted that at times a hammer will strike on the bell in the tower the number thirteen, to represent the number of the original States, and seventy-six to represent the year of the century in which the Declaration of Independence was made.

NEW BOAT-HOUSE. — The new boat-house for the Analostan Club, at Washington, stands at the foot of New Hampshire Avenue. It is fifty feet wide, eighty-five feet deep, and two stories in height. The first story is sixteen feet high, and the second fourteen feet high, both in the clear. The roof is double pitched, with cresting, open-work cornice, and brackets. On each side there is a balcony forty feet long. From the balcony on the front a fine view of the whole river can be had, from the Long Bridge to the aqueduct. The building is tinted a light brown, the ornamental parts of a darker hue. There are three large doorways in the front of the building, opening into the boat-room, which occupies the entire lower floor. From the main entrance on the first floor, a stairway leads to the rooms above. The ladies' reception-room, fifteen by twenty feet, with dressing and retiring rooms attached, is on the west side of the building. A large room on the east side of the building, twenty-eight by fifty-five feet, contains the lockers, dressing-rooms, and shower-bath, for the use of the members. A private stairway leads to the floor below. The club-room, a handsome apartment, twenty by fifty feet, occupies the south end of the second story, and opens upon the balcony on the river front. The ceiling of this room is open timbered. The windows are filled with stained glass, a blue bar on a white field, the colors of the club. The total cost of building was about twelve thousand dollars. Architect, W. M. Poindexter; builders, Downing & Bros.

MR. MOODY'S TEMPLE. — The building recently erected for Mr. Moody is said to be one of the most unique and convenient church-buildings in Chicago, with a seating capacity of about twenty-five hundred. It is built of brick and cut stone, in Gothic style; and is 100 x 120 feet, with a basement containing nine rooms, intended for Sunday school, library, reading and dining rooms, kitchen, and pastor's study. The upper part contains four class-rooms and an auditorium a hundred feet square, with a gallery all round, and seats arranged in circular style, so that every person faces the speaker. It is lighted with immense double windows, and a sky-light thirty-six feet in diameter. The ventilation will be effected by two great chimneys in the west wall, each four feet square, running from the basement to the roof, and communicating with the main floor by openings similar to an old-fashioned fireplace. The building cost $70,000.

CARVED PULPIT. — The Messrs. Schroeder of Cincinnati have sent to the Centennial Exhibition a carved oaken pulpit of Gothic style. It is hexagonal in form, stands eleven feet high, and is surmounted by a sounding-board richly ornamented with carvings. Four of the sides are occupied by bas-reliefs of scriptural subjects. Statuettes of the apostles occupy the angles of the cornice which runs around the pulpit just over the panels; while other statuettes of some of the fathers of the church decorate the sounding-board.

TRADE JOURNALS. — It is becoming more and more the custom for each trade and industry to have a journal specially devoted to providing for its wants; hence it is that new industrial journals are constantly appearing. The fact of their appearing shows that they are the outgrowth of a demand for them. Among the latest of these journals is the *Jeweller, Silversmith, and American Art Journal*, published in Philadelphia, which presents itself as a well-printed monthly quarto of fourteen pages. As it enters upon a field which is, we believe, unoccupied, it has every chance of succeeding. The *Iron Trade*, a weekly journal of eight folio pages, is another new journal, which enters on a field already occupied by such journals as the *Iron Age*, the *Trade Journal*, and the *Iron and Metal Review*; but if the discovery made by the publisher, that "the iron trade and its interests were only perfunctorily represented at the press; and that even this representation was irksome, as well as inefficient," be true, the *Iron Trade*, by supplying the deficiency, may have a prosperous career.

THE FOREIGN PERIODICALS.— The *Builder* for June 3 opens with a severe editorial criticism of the Book of American Interiors by C. W. Elliott. The other noticeable articles are "Bankside," one of the pleasant semi-historical, semi-topographical articles, that appear in the Builder from time to time; "Concrete as a Building-Material," being an account of an adjourned discussion of the Royal Institute of British Architects; and the "Scientific Congress at South Kensington." There is besides an unusual amount of short articles which make up the complement of the paper. The *Building News* continues its notices of the "Architecture at the Royal Academy;" gives an account of the meeting of the Royal Institute of British Architects; "The Architectural Science Class" is engaged upon "Rib-Vaulting;" the editorial treats of a "New Walhalla for Germany." In this number appears a view of "The Wispers near Midhurst," which was recently mentioned by our London correspondent. In the *Architect* appear continuations of the notices upon the "Royal Academy," of the "Law of Fixtures," and of "Notes upon some Points of Design in Ecclesiastical Architecture." The meeting of the R. I. B. A. is reported. "Acoustics in Architecture," by Mr. A. F. Oakey, is reproduced from our issue of April 29; and "Mr. Pullan's System of Proportion" is still further illustrated by two pages of diagrams. The *Skizzen-Buch* as usual has six plates, among them a house in Berlin after the accepted German rendering of the Greek style; a house front in Cologne; a villa near Potsdam, which could be found nowhere but in Germany; a railway station; and a garden hall.

CONCRETE. — From remarks made at the closing discussion "On Concrete as a Building-Material," by the Royal Institute of British Architects, it appeared that noise was very easily transmitted in concrete buildings, especially when the floors as well as walls were of concrete, occupants of adjoining houses being almost able to hear what was said next door; that it was absolutely necessary to introduce a damp course of tin-foil or some similar material; that concrete buildings can be erected only at those seasons of the year when there are no frosts; that the advocates of the system were doing it an injury by asserting that concrete buildings were only half as expensive as brick buildings, whereas the difference was probably not more than ten per cent; that the strength of pure cement decreased in proportion to the admixture of sand; that, in the opinion of about four hundred builders, no more moisture was condensed in a concrete wall than in a brick wall; that shrinkage in concrete was practically unknown; and that the use of timber and iron with concrete was both practical and judicious.

PROTECTING ST. PAUL'S. — At a late meeting of the Royal Institute of British Architects, Mr. Cates spoke of the measures taken to secure the dome of St. Paul's against fire. One section of the cupola was taken, divided by five of the trusses; and the two extreme trusses were filled in with Brannon's stone felt, separating the cupola from other portions. The other rafters had also been coated with the same material. In order to protect the timbers, which are of oak of large scantling, and form a series of vertical studs and posts, each was completely incased in a coating of Brannon's concrete composition, applied in a liquid state, which is thought to be superior to terra-cotta for resisting fire. The section of cupola so protected is that through which visitors pass on their way to the lantern, and hence is more exposed to accident than other portions.

EQUESTRIAN STATUE. — The municipality of Paris have decided to erect an equestrian statue to King Philip Augustus. The artist is not yet selected. The statue is to be finished, however, by 1878.

THE ALHAMBRA.— It is proposed to again make the Alhambra a part of the royal property, in which case it may again become as inaccessible to travellers as it was before 1869, when it was taken from the Crown, and made national property; a commission being appointed who placed it under the guardianship of the Academy of San Fernando, and have expended a large sum annually to keep it in repair. But now the Government cannot afford to keep it up, and seeks to transfer it to the Crown. If this transfer is effected, there is no telling what may be the fate of the Alhambra, as the king already has an abundance of residences.

SCANDINAVIAN TUMULUS. — A tumulus of unusual size has lately been opened near the Nordfjord in Norway, dating apparently from the year 800. It was stored with all the magnificent belongings of a viking chieftain. A bowl of precious enamel, a store of amber, a massive belt of bronze, rank among the most splendid trophies of the viking period which have come down to us. There were also some stone balls, flattened at one side, with a dint in the centre of the base, which some regard as marbles, flattened for use on board ship; but others argue that they belonged rather to a peculiar game now no longer in vogue, and played on shore. This theory is supported by references found in the ancient sagas.